

Parkland College

General Science

Natural Sciences Courses

2015

Science 108-001 Essentials of Forensic Science Fall 2015

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Science 108-001 -- Essentials of Forensic Science

Fall 2015

Instructor:

Christina Beatty, Associate Professor

Section 001 LAB: Tues. 9-11:50am in M229 (or X104)

LECTURE Thurs. 9-11:50am in L217

Guest Instructors:

Sgt. Bruce Ramseyer, Champaign PD Bruce.Ramseyer@ci.champaign.il.us

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My Instructor Information

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Course Overview:

This course is an introduction to the application of science to criminal and civil cases, including an overview of forensic chemistry, forensic biochemistry, and other sub-disciplines in forensics. Special emphasis will be placed on the techniques of sampling a crime scene and the use of physical evidence to help solve cases. This course fulfills the IAI interdisciplinary science (LP 900L) general education elective.

Course theme: This course can best be summarized by the word evidence. We will be learning about evidence, what it is, where it can be found, where it comes from, how to analyze it, how valuable it is in a criminal case, etc. So, many of the activities are to help you learn as much as possible about the importance of evidence in criminal proceedings.

General Course Objectives:

PREREQUISITE: This course requires a *placement in ENG 101*.

In this course, we will introduce some of the scientific concepts / principles that are applied in criminal and civil cases so that you (the student) can:

1. Increase your scientific literacy
2. Increase your exposure to and understanding of scientific endeavors
3. Create an environment that illustrates the importance of careful data collection and recording to the successful crime investigation.
4. Develop a strong understanding of the physical and biological fundamentals underpinning the practice of forensic science to crime scenes.

Required Materials:

1. Saferstein, Richard (2010), **Criminalistics: An Introduction to Forensic Science**, 10th Edition, Prentice-Hall Inc. [used] **OR**
Saferstein, Richard (2014), **Criminalistics: An Introduction to Forensic Science**, 11th Edition, Prentice-Hall Inc. [new edition]
2. Parkland Natural Sciences Staff (Fa '14 edition), **Science 108 Course Packet**,
3. **Lab Safety Goggles**. Note that only lab **safety goggles**, not safety glasses, can be worn in the chemistry lab.
4. **3-ring binder**: You will want to **KEEP everything** for the entire semester because you will be allowed to use any materials you want during the CRIME SCENE REPORTS.
5. **iClicker** (available in the bookstore or online). **You may also forgo purchasing a clicker and use your smartphone/tablet/laptop. More information is at <https://www1.iclicker.com/products/reef-polling/>. You can select a free 14-day trial to start. Ask your instructor for more info.
6. **Quarter for lab lockers**
7. **Spiral Notebook** (can be left over from another course, 30-40 pages is enough) (bring to lab in Weeks 4, 9, 15, will be turned into instructor so be sure it's not for another current course)
8. **Pencil** for exam days

The Mission of Parkland College is to engage the community in learning.

General Education Requirements – IMPORTANT!!!:

In order to satisfy your general science requirement at Parkland you must take 1 life science (some sort of biology) and 1 physical science (chemistry, physics, astronomy, earth science). Another option is to take 2 interdisciplinary science courses. Parkland currently has 2 such courses. They are Science 108 (Essentials of Forensics) and Science 208 (Forensic Science II). Sci 108 is technically 50% life science and 50% physical science. The same applies to Sci 208. Therefore taking both 108 & 208 satisfies a 1 semester life science + 1 semester physical science requirement. But Sci 108 alone does NOT fully satisfy 1 full semester of life science and/or 1 full semester of physical science. Please let me know if you have any questions about this requirement.

The following general education objectives are introduced or assessed in this course.

Upon completion of Sci 108, students should be able to:

- demonstrate their ability to read, write, listen, and speak effectively;
- demonstrate their ability to solve problems, by collecting and evaluating facts and using methods of scientific inquiry;
- demonstrate their ability to use technology, especially computer technology, to access, retrieve, process, and communicate information;
- demonstrate information literacy and their ability to think critically, which includes identifying biases and selecting and evaluating sources from varying as well as conflicting positions;

Drops & Withdrawals:

Important dates:

Aug. 31: At Census Day, I am required to assess your attendance. If you have not attended to that point, you will be **withdrawn** with no refund of tuition and fees and you will receive a “W” on your transcript. After this census date, you should not plan on an instructor withdrawal if you want to withdraw from the course. You are ultimately responsible for your own withdrawal by the withdrawal date. Non-attendance after the census date may result in an F if you don't withdraw yourself.

Oct. 16: Up until this point, the instructor *may* (but won't automatically) **withdraw** you from the class and a “W” will appear on your transcript. After this date, an instructor CANNOT withdraw you. You must withdraw yourself **by going to the Admissions Office** (see page 5 in the Parkland class schedule for more information on how to withdraw). Also, **nonattendance after Midterm will result in an F (not a W), unless you withdraw yourself from the class before the withdrawal date listed next.**

Dec. 4: **The last day you (as a student) can withdraw from this class is before 5:00 P.M. on this day.** A “W” will appear on your transcript instead of an “F”. Again, an *instructor* cannot withdraw you past the midterm date.

Cell phone policy

Cell phones are not allowed in lab at all. Due to the increasing amount of cell phone use in lectures, pending the instructor's decision:

- ...having your cell phone out in class may result in a 0 for clicker and/or teamwork points for the day.
- ...having your cell phone out in M229 (lab) may result in 20% (10 pts.) off that day's lab points.

If you must use your cell phone, you may...

- Leave the room to use it
- Explain to your instructor the special circumstance (i.e. calculator use, family emergency) why you need your cell phone out to get permission to not lose points

Academic Policies:

Absences – What is an excused absence?

An excused absence is any absence that is due to personal illness, family emergency, **major** weather, or a Parkland sponsored event that you have documentation for. **(Note: You should bring in documentation - e.g. doctor's note or coach's note - if you expect an absence to be considered excused.)** An unexcused absence is any other absence. Generally, work missed during unexcused absences cannot be made up, or will be penalized by a zero. The lowest assignments in most categories are dropped. However, see “freebies” below.

Make Ups:

If you have an **EXCUSED** absence, (as defined above) then you will be allowed to make up the work that you missed or I may provide a suitable alternative. The procedure (and possibility) for a make-up will depend on the type of assignment that you need to make-up.

“Freebies” can be used to turn completed assignments in late for full credit. Please read the directions on the “freebies” and ask your instructor for clarification.

Make-Ups for Labs

YOU MUST ATTEND THE MANDATORY SAFETY INTRODUCTION or you will not be able to perform any future labs. For all other labs, if you inform me in a timely manner of the class date that you are to miss then it may be possible for you to make up the lab during the other lab section of Science 108 (see below for times). *Please note* — *You must have my permission to attend a different lab section.* You will still be responsible for the material in any missed labs – such as on the crime scene reports - whether excused or unexcused.

<u>Science 108 lab sections in X104 or M229:</u>			
Section 002H	Mon	5:30pm - 8:50pm	
Section 001	Tues	9:00am - 11:50am	

Attendance policy:

Attendance is extremely important in Sci 108. Lab work and teamwork cannot be easily made up at home.

Lab:

As with other classes and a job, it is important to be on time for Sci 108. This is particularly important for labs. Arriving late to lab means you, the student, miss important safety information and key instructions on how to operate equipment and use techniques properly. Missing these instructions may cause harm to you, another student, or lab equipment. Arriving late to lab will be defined as: **arriving after the instructor has started going over the lab intro** (safety and other details) with the class after prelabs are checked. Therefore, if you arrive late to lab, you will **lose points**. However, it's ultimately at the instructor's discretion to admit or not admit a student if a student is late and this would count as an unexcused absence.

Lecture:

Arriving late to lecture means clicker questions that cover review and the reading material will be missed and cannot be made up.

Academic Honesty:

An atmosphere of mutual respect between and among teachers and students is expected in this class. Anyone found to be cheating /committing plagiarism on an assignment , exam or report will receive a ZERO for that assignment and the incident will be reported to the college. The instructor reserves the right to give a zero for all previous assignments in that category and require an alternate assignment for future assignments in that category. Cheating includes getting or providing answers from or to another student during before, or after an exam, lab etc., copying answers to assignments from the Internet or other students' assignments (from this or previous semesters) and/or plagiarism. **THIS INCLUDES iCLICKER USE.** There may be random iClicker serial number checks during the semester. If you are found with a clicker other than the one you originally registered, all other previous clicker grades will become zeroes. The complete policy on academic honesty may be found in the *Student Policy and Procedures Manual* – please review this policy in the Student Manual. More on Academic Honesty can be found here: <http://www.parkland.edu/studentpolicy/honesty>

On every assignment that you complete at home, the following must be written in your handwriting: “**I honor Parkland’s core values by affirming that I have followed all academic integrity guidelines for this work.**” If it is not handwritten on your assignment, it will be returned as a zero. It can be resubmitted with the phrase asap for credit.

Course Components & Grading Policy:

Grades in this course are based on a percentage of the total points (see table). There are **roughly 1500 points** in the semester but your final grade will be based on the table to the right.
No plus or minus grades are given at Parkland.

The final grade cut-offs are as follows to the right:

At least 90. % =	A
At least 80. % =	B
At least 70.% =	C
At least 60.% =	D
Less than 60.% =	F

Late Work:

NO LATE WORK IS ACCEPTED unless you use “freebies” (explained below) **or you have a documented, excused absence.** You may, however, turn in assignments ahead of time if you know you will be absent.

“Freebies”:

(6 x 4 pts. each = 24 points possible)

A “Freebie” is worth **4pts.** You may use up to **6** freebies total to do the following.

- Borrow a pair of goggles = 1 freebie (4 pts.)
- Arrive more than 5 min. late to lab or no prelab complete = 2 freebies (8 pts.)
- Turn in 1 chapter reading guide or do 1 webquest a week late = 2 freebies (8 pts.)
- Turn in 1 team activity 1 week late from an absence = 2 freebies (8 pts.)
- Do your presentation 1 week late = 3 freebies (12 pts.)
- Turn in Midterm or Final Report 4 hours late: 1 freebie (4 points)

Please note that **any attempt to use more than your allotted 6 freebies** will result in a **zero** for **all** homework points. Freebies are only valid with your full name on it.

Grade Components:

<u>Category</u>	<u>Description</u>	<u>Points</u>
Homework: Chapter Reading Guides and Webquests <i>(outside of class)</i>	<p>For each lecture topic that has a reading assignment from the text, you will be required to read the relevant material and complete a reading guide, found on Cobra. You may print it out (or neatly write on notebook paper while looking at the computer screen), fill it out while reading and use it on the clicker questions. All reading guides are due by the beginning of lecture of the week. <i>If you are found writing on them during class, you will receive a zero.</i> This assignment is designed to prepare you for the richer classroom activities.</p> <p>A Web Quest is an internet search for information on a particular topic. For topics in which there is no corresponding reading material in the text, or where the information in your text is inadequate, you will be required to complete a Web Quest before class. These will be made available to you on Cobra. Web Quests will generally be due at the beginning of lecture. For some material, there may be a Web Quest in addition to the Chapter Reading Guide.</p>	<p>18 x 8pts. each =144 pts.</p> <p>(No assignments will be dropped but some can be turned in late with freebies. Each chapter or webquest is worth 8 points.)</p>


Clicker Questions (in class)	"iClickers" will be used to check preparedness for lecture and stimulate class discussion. You may use the reading guide or any handwritten notes or that you take from the reading assignments. There are no make-ups for clicker questions. If you are late – you cannot receive points for the questions you missed. **You may also forgo purchasing a clicker and use your smartphone/tablet/laptop. More information is at https://www1.iclicker.com/products/reef-polling/ . You can select a free trial to start.	12 weeks x 4 pts./wk =48 pts. (Out of 14 weeks, the highest 12 weeks are kept)
Team Activities & Quizzes (in class)	Each of you will be assigned to work in a team throughout the semester in both lecture and lab. Once a week, you will work with your team to complete an activity and take a group quiz related to the reading or Web Quest for the current week and incorporating material from previous weeks. You may use any resources, including your text, for these. If you leave class early or miss class, freebies must be used to turn in a team activity the next class period. Freebies cannot be used for team quizzes.	22 x 8 pts. each = 176 pts. (Out of about 25, the highest 22 are kept)
Case Presentation	Most of the chapter opening case studies have some evidence associated with them. You will choose 1 case study and present on it. See presentation sheet on Cobra for details.	= 60 pts.
Prelabs (before class) and Lab Reports (in class)	PRE-LABS: This is due by the time lab STARTS for that week . The pre-lab includes reading the entire lab and writing a <i>solid paragraph</i> summary of the purpose and procedure in the space provided. <u>If this is not done, you may not perform the lab</u> OR you can use freebies to do the prelab and come "late" to lab. The purpose of this is to make sure you've read the lab – this is essential for safety reasons. – a few of these points are also designated as coming prepared to lab by having goggles, wearing long pants and closed toed shoes and by evidence of having read the lab LAB REPORTS: For each lab you are to record data, perform calculations, answer questions, etc. Any worksheets from the lab manual must be removed and submitted to your instructor. You may study with others, but you are required to submit your own work. Each lab is worth about 28 points.	Intro lab = 12 pts. Then 11 labs x 28 pts. each = 320 pts. (Out of 12 labs, the highest 11 will be kept)
Exams (in class)	There will be 4 exams during the semester: part scantron multiple choice, part free response. Please bring a pencil on exam days. These will cover material in the Lectures, Labs and Team Activities. <i>1 side of an 8.5" x 11": sheet of paper with notes in only your own handwriting (only) is allowed per exam.</i>	4 exams x 150 pts. each but 1 lowest exam <i>or paper*</i> is dropped = 450 pts.
Crime Scene Reports	You will be given evidence to analyze from a crime scene. You will analyze it and write a midterm report and then a final report dealing with a criminal case. You will have the opportunity to perform various laboratory tests on the evidence in order to solve the crime. <i>You may use all past labs, notes and/or your textbook.</i> Each person will write their own report – working together on <u>writing</u> the report is considered cheating in this class. ***Note: Exams and Reports will be in 1 gradebook category, with the 6 items worth 150 points each. The lowest exam <u>OR</u> report will be dropped.	Midterm = 150 pts + Final = 150 pts. =300 pts. (but you may drop 1 paper instead of a low exam*)
Misc.	There may be a few other miscellaneous assignments to complete.	= 2 pts.
SEMESTER TOTAL = ~1500 points (subject to change). Final Grade is based on percentage.		

Sci 108 Course & Assignment Schedule for (Section 001) FALL 2015

For my section, **“Due for Lab” means: TUESDAY, 9:00am** and **“Due for Lecture” means: THURSDAY, 9:00am**

WEEK	<u>Lab Assignments due each week</u> Lab is in M229 unless otherwise noted. Each “⚙” symbol indicates a separate prelab to do. Find the lab title in the table of contents.	<u>Lecture Assignments due each week</u> Reading Guides (RG) for Saferstein’s text (RG are on Cobra) And/Or Webquests are due each week. Each “thing” due is represented by a ⚙. “OR” is used because there are 2 versions of the textbook. Read carefully.
Week 1 8/24-8/28	<u>During Lab:</u> Introduction to course Dissecting Microscope (Stereoscope) Introduction (in M229 then move to X104) <u>Due for Lab:</u> Nothing. Welcome to the course!	<u>Lecture topic:</u> Intro to Forensic Science <u>Due for Lecture:</u> ⚙RG: Introduction [Ch 1: in 10 th & 11 th ed.] AND ⚙Intro email thru Cobra to instructor AND ⚙Syllabus quiz on Cobra. (And turn in signed syllabus sheet & letter to instructor if not already turned in).
Week 2 8/31-9/4	<u>Due for Lab:</u> 1 Pre-lab Summary due: ⚙ <u>Sci 108 Intro Lab</u> Lab is back in M229 . Bring goggles and <i>remember proper lab attire: goggles, no sandals and wear pants</i>	<u>Lecture topic:</u> The nature of science & critical thinking <u>Due for Lecture:</u> ⚙Webquest 1 (found on Cobra)
Week 3 9/7-9/11	No classes Monday for Labor Day <u>No Lab</u> (or pre-lab) this week for all sections of Sci 108. Attend field trip instead.	<u>Lecture topic:</u> Physical evidence intro Lecture <u>Due for Lecture:</u> ⚙RG: The Crime Scene [Ch 2 in 10 th & 11 th ed.] AND ⚙RG: Physical Evidence [Ch 3 in 10 th & 11 th ed.]
Week 4 9/14-9/18	<u>Lab:</u> Crime scene analysis (in M229) and Library visit (Bring required blank notebook to lab) <u>Due for Lab:</u> Sign up for a timeslot. Nothing due (no pre-lab) but bring required blank notebook and wear proper lab attire AND ⚙alternate assignment for field trip <u>if</u> you didn’t attend last week.	<u>Lecture topic:</u> Fingerprinting <u>Due for Lecture:</u> ⚙RG: Fingerprinting [Ch. 16 in 10 th ed. OR Ch. 6 in 11 th ed.]

WEEK	Lab Assignments due each week Lab is in M229 unless otherwise noted. Each “🌀” symbol indicates a separate prelab to do. Find the lab title in the table of contents.	Lecture Assignments due each week Reading Guides (RG) for Saferstein’s text (RG are on Cobra) And/Or Webquests are due each week. Each “thing” due is represented by a 🌀. “OR” is used because there are 2 versions of the textbook. Read carefully.
Week 5 9/21-9/25	During lab: 🌀 WRITTEN EXAM 1 during lab in X104, then lab in M229 (you can bring a note sheet – see Cobra) (Yes, still a prelab summary due) Due for Lab: 1 Pre-lab Summary due: 🌀 <u>Fingerprinting Techniques</u> . Lab is in M229 . Bring goggles and <i>remember proper lab attire: goggles, no sandals and wear pants</i>	Lecture topic: Microscopes intro; Trace Evidence: Hairs, Fibers, & Paint Due for Lecture: 🌀RG: The Microscope [Ch 7 in 10 th & 11 th ed.] AND 🌀RG: Hairs, Fibers, (& Paint) [Ch. 13 in 10 th ed. OR Ch. 10 in 11 th ed.]
Week 6 9/28-10/2	Due for Lab: 1 Pre-lab Summary due: 🌀 <u>Compound Microscope Intro</u> Lab. Lab is in X104 . No goggles needed.	Lecture topic: Glass & Soil; Metric System Due for Lecture: 🌀RG: Physical Properties: Glass & Soil [Ch 4 in 10 th ed. OR Ch. 9A in 11 th ed.]
Week 7 10/5-10/9	Due for Lab: 3 Pre-lab Summaries due: 🌀 <u>Measurement Intro</u> 🌀 <u>Soil Analysis</u> 🌀 <u>Glass Analysis</u> Lab is back in M229 . Bring goggles and <i>remember proper lab attire: goggles, no sandals and wear pants</i> .	Lecture topic: WRITTEN EXAM 2; Presentations; Lab Midterm Prep Due for Lecture: 🌀 WRITTEN EXAM 2 (can bring a note sheet – see Cobra) AND (🌀)Presentation (if it’s your turn) Bring notebook with crime scene notes
Week 8 10/12-10/16	During Lab: Lab Midterm - You will use course material to analyze evidence in a criminal case study. Due for Lab: 🌀Bring your blank notebook to lab with midterm prep done. Read over police reports online in Crime Scene folder. No prelab due. <i>Remember proper lab attire: goggles, no sandals and wear pants</i> .	Lecture topic: Chemistry intro; Presumptive and Confirmatory Tests; Inorganic Analysis (Metals) Due for Lecture: 🌀RG: Chemistry Intro [Ch 5A in 10 th ed. OR Ch. 9B in the 11 th ed.] AND 🌀RG: Inorganic Analysis (Metals) [Ch 6 in 10 th ed. OR Ch. 13 in 11 th ed.]

WEEK	Lab Assignments due each week Lab is in M229 unless otherwise noted. Each “☼” symbol indicates a separate prelab to do. Find the lab title in the table of contents.	Lecture Assignments due each week Reading Guides (RG) for Saferstein’s text (RG are on Cobra) And/OR Webquests are due each week. Each “thing” due is represented by a ☼. “OR” is used because there are 2 versions of the textbook. Read carefully.
Week 9 10/19-10/23	Due for Lab: 3 Pre-lab Summaries due: ☼ <u>Mixed Reception computer lab</u> ☼ <u>Flame tests</u> ☼ <u>Using UV and visible light</u>	Lecture topic: Organic Chemistry Analysis Due for Lecture: ☼ RG: Organic/Drug Analysis [Ch 5B in 10 th ed. OR Ch. 11A in 11 th ed.]
Week 10 10/26-10/30	Due MONDAY, 10/26/15 at 12:00pm: ☼ Midterm Report – See Cobra Due for Lab: 2 Pre-lab Summaries due ☼ <u>Identification of ink & drugs by TLC.</u> ☼ <u>IR Spectroscopy to Identify an Unknown White Powder</u>	Lecture topic: Toxicology (drugs & alcohol) Due for Lecture: ☼ RG: Drugs [Ch. 8 in 10 th ed. OR Ch. 11B in 11 th ed.] AND ☼ RG: Forensic Toxicology [Ch. 9 in 10 th ed. Or Ch. 12 in 11 th ed.]
Week 11 11/2-11/6	Due for Lab: 2 Pre-lab Summaries due ☼ <u>Analysis of Over-the-Counter Drugs</u> ☼ <u>Paper Chromatography</u>	Lecture topic: Fire Investigation & Arson (guest lecturer or field trip?) Due for Lecture: ☼ RG: Forensic Aspects of Fire Investigation [Ch. 14 in 10 th ed. OR Ch. 16 in 11 th ed.] but if we have a field trip, this will be due later (week 12).
Week 12 11/9-11/13	Due for Lab: 2 Pre-lab Summaries due: ☼ <u>Methods for the GC (Gas chromatography)</u> ☼ <u>Bloodstain and spatter analysis</u>	Lecture topic: Blood Spatter analysis & Fire Teamwork (if not done last week) Due for Lecture: ☼ RG: Bloodstain Pattern Analysis [Ch. 12 in 10 th ed. OR Ch.4 in 11 th ed.] AND ☼ RG: Forensic Aspects of Fire Investigation [Ch. 14 in 10 th ed. OR Ch. 16 in 11 th ed.] <u>if it wasn’t already due last week.</u>
Week 13 11/16-11/20	During Lab: ☼ WRITTEN EXAM 3 & Presentations. Meet in X104 Due for Lab: <i>you can bring a note sheet – see Cobra</i> AND (☼)Presentation (if it’s your turn). No pre-lab due	Lecture topic: Biochemistry; Blood Typing; Lab Final Prep Due for Lecture: ☼ Webquest 3 (Biochem) AND ☼ RG: Forensic Serology [Ch. 10 in 10 th ed. OR Ch. 14 in 11 th ed.] Bring lab midterm notebook to prep for lab final.
Week 14 11/23-11/27	Due for Lab: 3 Pre-lab Summaries due: ☼ <u>Biochemistry</u> ☼ <u>Blood typing</u> ☼ <u>Blood Detection with Luminol</u>	No Classes Thurs/Fri at Parkland. Happy Thanksgiving! 

WEEK	<u>Lab Assignments due each week</u> Lab is in M229 unless otherwise noted. Each “⌘” symbol indicates a separate prelab to do. Find the lab title in the table of contents.	<u>Lecture Assignments due each week</u> Reading Guides (RG) for Saferstein’s text (RG are on Cobra) And/Or Webquests are due each week. Each “thing” due is represented by a ⌘. “OR” is used because there are 2 versions of the textbook. Read carefully.
Week 15 11/30-12/4	<u>Lab: Lab Final</u> - You will finish analyzing evidence to write up a Final Report due during Week 17 <u>Due for Lab:</u> Lab Final notebook prep. (No prelab due)	<u>Lecture topic:</u> DNA <u>Due for Lecture:</u> ⌘RG: DNA [Ch. 11 in 10 th ed. OR Ch. 15 in 11 th ed.]
Week 16 12/7-12/11	<u>Due for Lab:</u> 1 Pre-lab Summary due: ⌘ <u>DNA Extraction & Typing</u>	<u>Lecture topic:</u> Hot Topics in Forensics; Presentations <u>Due for Lecture:</u> ⌘ <i>Extra credit webquest (optional)</i> AND (⌘)Presentation (if it’s your turn).
Finals Week 12/14-12/18	⌘ <u>Final Report due TUESDAY, 12/15/15 at 12:00pm – See Cobra</u> <i>Extra credit for turning it in more than 48 hours early.</i>	⌘ <u>Written EXAM 4 during final exam period</u> (<i>You can bring a notesheet</i>). It is not cumulative. Section 001: Thurs. 12/17/15 at 11am-1pm (likely in X104)